133 river as it flows through gorge, but from e. mouth of gorge for 60 mi. downstream there is drop of 50 ft. per mi. in river's course. There are 2 periods of high water in Kern r.; one during winter rain-flood from Jan.-March, second during summer snow-flood, from May-July; lowest water occurs in October (Gifford and Schenck, 17). Minimum flow of Kern in dry season 2700-3000 cu. ft. per second, in season greatest capacity over 19000 cu. ft. per second (Pen Pictures, 248).

133 Three valleys lie at 2500-3000 ft. elevation.
132 They are in a climatic province which is semi-arid, with mesothermal temperature and summer deficiency of rainfall (Thornthwaite, pl. 3). Temperatures from 110-115° F. not uncommon in July-August; winters not severe, but generally some snow falls in valleys, more on foothills, and there are always heavy snows in mts. Precipitation records for Kernville, in Kern valley, are:

Year	Rainfall (in inches)	No rainfall
1924	6.48	May-September (inclusive)
1925	7.43	September
1926	11.66	June-September (inclusive)
1927	10.37	May-September (inclusive)
1928	6.47	June-September (inclusive)
1929	5.04	July, Aug., Oct.-Dec.
1930	6.97 plus 19 in. snow	June-October (inclusive)
1931	9.92	May, September
1932	7.34	July-November (inclusive)

[312] Previous to white settlement and diversion of water for agriculture, South Fork valley contained 2 large lakes, W of Onyx, NW of Weldon on
[175] Jesus ranch (SM). In 1776 Garcés, writing of unaugmented Kern near Kernville, says, "On this famous river, which I named Rio de San Felipe, there are abundant pastures, famous woods, and much irrigated ground (tierra de regadio)" (Garcés, 282). In foothills which enclose valleys are numerous hot and cold springs and intermittently flowing streams.

●137 Vegetation of 3 valleys and lower foothill regions mixed; Shantz and Zon include valleys in chaparral area; my botanical collections from valley-foothill region contain specimens from desert, foothill, and Great Basin floral areas. This mixed vegetation area extends in E-W line across s. base of Tübatulabal territory. N of it are several different forest belts extending in N-S line; on w. edge of area along Greenhorn mts., is spruce-fir strip; E of this along canyon of unaugmented Kern strip of yellow pine-sugar pine forest; E of this another spruce-fir strip and finally on e. edge of Tübatulabal territory strip of piñon-juniper forest (Shantz and Zon). In extreme n. part of Tübatulabal area, on w. slope of Sierras, is found subalpine forest and, at higher altitudes, alpine communities (Klyver, 8). In terms of Merriam's life zones, using tree indicators of Grinnell and Storer (Grinnell and

●137 Storer, 11) all life zones, Lower Sonoran, Upper Sonoran, Transition, Canadian, Hudsonian, and Alpine-Arctic, represented in Tübatulabal-Palagewan area.

136 Fauna of area as whole also highly varied, but at present time several animal species Tübatulabal formerly used are either extinct or rare in foothill-valley areas. Jackrabbits, cottontails still abundant in these areas; blue squirrels numerous in foothills. In SM's father's time brown bears were "thick, like hogs" on floor of South Fork valley (SM). Prong-horned antelope (Antilocapra americana americana Ord.) formerly ranged in valley-foothill region, but have been extinct in Calif. since 1900 (Seton, 213, pl. 9). Mt. sheep or Nelson's bighorn (Ovis cervina nelsoni Merriam) formerly dwelt in foothills; California wapiti or dwarf elk (Cervus nannodes Merriam), which is found only in Kern co., Calif. (Anthony, 515), known to informants, but its range did not extend into Tübatulabal area (SM). Single species of deer found in area (SM); probably mule deer, also known as Rocky mt. mule deer or blacktailed deer (Odocoileus hemionus), primitive range of which, according to Seton, extended only into e. part of Tübatulabal area (Seton, 118, map 6), where it was hunted by Tübatulabal (Voegelin, 1935b, 227). Tübatulabal, however, also availed themselves of another species of deer, California mule deer (Odocoileus hemionus californicus) when they went W, beyond limits of their area, to gather acorns (SM).

Snowshoe rabbit (Lepus klamathensis), which lives in high Sierras, known to several informants.

Wild game birds of many varieties formerly plentiful in area; golden eagle nested in region; informants had seen bald eagles at Ventura, but none in Tübatulabal area.

311 Present economic status of group.- Several individuals have retained land granted them in 1893,
241 and cultivate small garden patches, 1/2-1 acre in
511 extent, on their grants. Principal crops are corn, beans, potatoes, tomatoes, peppers, wheat. Ma-
[463] jority of young and middle-aged men work as cowboys and ranch hands on stock ranches in South Fork valley; women help men in cultivation of
[462 garden patches, and often raise turkeys, chickens,
231] geese, chiefly for family use. In years when piñon crop is good, men, women, and children gather the
[222] nuts for their own use and to sell. In 1933 SM was making hair ropes, leather riatas to sell,
177 cultivating garden; ES did a little beadwork, had garden, but relied on her husband, who worked on ranch, for support; LT and FP were being supported chiefly by LT's adult sons, who were ranch hands; MM worked occasionally on ranches, did road work at Bishop, etc. References to other types employment made in FP's, MM's autobiographies (p. 72; Voegelin, 1935 b, 223). None of Tübatulabal, so far as I know, receive any annuities. Census data for 1932 showed there was marked tendency among

226
417

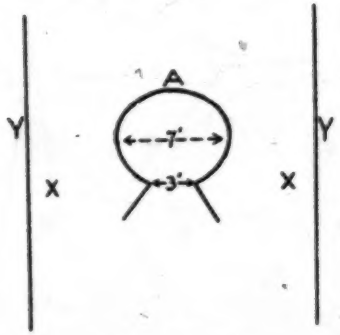

Fig. 2. Fish corral. A, wall of corral, X, men with poles, Y, banks of stream.

226 Another method of obtaining fish in large quantities was to stupefy them; roots, stalks, leaves of plant (pa·lu·l) which "looks like cane, grows in moist soil, has leaves that get reddish-yellow in fall" and which SM identified from drawing as sp. of Smilacina, mashed slightly, [171] thrown into quiet pools. Buckeye, turkey mullein, soaproot, all available to Tübatulabal and used by other tribes as fish poison, not used (SM, FP). In poisoning fish, no dam built; as fish floated to surface they were scooped up in conical twined tule baskets.

226 411 In winter fish sluggish, "hardly move"; mainly harpooned or speared from rafts in Kern r. and South Fork valley lakes by individuals. Fish spear long pole with 2 wooden points sharpened by rubbing on rock.

252 Fresh fish cleaned, roasted whole; 4 large fish often tied together, wrapped in branches of odorless willows (poyiwošt; p. 12) and cooked in ashes at fishing place; carried home in willow wrapping. Mussels cooked by roasting in shells in hot ashes. [251] Fish one of foods Tübatulabal stored for winter use.

824 ●137 Ethnobotany.- Botanical collections made chiefly in South Fork, Kern valleys, and surrounding foothill regions in May-July; collections checked with SM, ES chiefly. Some 220 species collected, 130 of which informants said were put to economic or medicinal uses; 56 of these ethnobotanical species belong to foothill floral area, 40 to desert floral area, 10 to Great Basin floral area; remainder general in distribution.

In identifying specimens, informants tasted, smelled plants if dubious about identification.

Of plant foods, those starred mentioned most frequently by informants; possibly these plants used most commonly for food in aboriginal times.

Nuts, large seeds (generic term, punṣil) included: *Acorns (generic term, wa'ant). Six varieties used: (1) acorns (maŋi·l) from blue oak (maŋi·'u·l), Quercus douglasii H. & A., foothill floral area; these grow on n. slopes of Paiute mts. at s. borders Tübatulabal area; nuts mature annually, large, "don't taste bitter after leach-

824 ing" (SM); "pretty good; not very bitter" (FP).
●137 (2) Acorns (winiya·l) from black oak, Q. californica (Torr.) Cooper; grow in Greenhorn mts.; nuts mature biennially; "good, oily; don't need much leaching" (SM); "these were the best; we went for them every yr." (FP). (3) Acorns (yu·mukt) from Wislizenus or live oak (yu·mu·gul), Q. wislizeni A. DC., foothill floral area; grow in some profusion in lower foothills of 3 valleys; nuts small, mature biennially, "bitter" (SM), "take all day to leach" (FP). (4) Acorns (takwat) from California scrub (takwa·dul), Q. dumosa Nutt. (?); grow "over by Paiute mts., also on Greenhorn mts."; nuts mature annually, "rather small, bitter" (SM). (5) Acorns (wa'anwĭt) from maul oak (wa'anul), Q. chrysolepis Liebm., foothill floral area; grow "up in mts. W of Chimney meadows" (SM); nuts mature biennially, "pretty bitter" (SM). (6) Acorns (ši·bi·l) from valley oak (ši·bi·'ĭ·l), Q. lobata Nee; grows in San Joaquin valley; nuts large, abundant, mature annually; "sweet"; Tübatulabal made trips into Yokuts territory "around Porterville" to gather these (SM).

*Piñons (tĭbat) from single-leaf or piñon pine, Pinus monophylla, Great Basin floral area; cones mature biennially; nuts rich in oil; piñon pine found at altitudes 4000-6000 ft., chiefly in e. part of Tübatulabal area.

*Pine nuts (wohont) from Digger or gray pine (wohonol), Pinus sabiniana, foothill floral area; cones mature biennially; trees common throughout foothills in area.

Buckeye nuts (pa·ša·'ul) from California buckeye, Aesculus californica Nutt., foothill floral area; grows in great profusion on steep sides of Kern r. gorge.

Sunflower seeds (ta·lata·ugibĭ·l); post-white; formerly planted in gardens.

Seeds, berries (generic term, anht) included: *Chia seeds (pa·ši·l), Salvia columbariae Benth.; *thistle sage seeds (pacist), S. carduacea Benth.; desert floral area.

*Bunch grass or wild rice (u·gibĭ·l), Echinochloa crus-galli (L); alkaline weed.

*Mentzelia albicaulis Dougl. (ku·l) and M. gracilenta T. & G., desert and Great Basin floral areas.

*Wild oats (ma·št).

*Rabbit's foot or beard grass (po·mbikanan, furry), Polypogon monspeliensis (L.) Desd.; general in distribution.

*Seeds of wild heliotrope, Heliotropium curassavicum L., alkaline areas in general, and seeds of Eriogonum species (tu·nabo·l). Specimen of 2 other varieties of seed plants (šo·'itih and pa·waqul) not obtained.

*Gooseberries (wopnil), Ribes quercetorum Greene, foothill floral area; abundant in lower foothills of area.

*Boxthorn berries (pi·'ict), Lycium torreyi Gray, desert floral area.

Manzanita berries (kĭnal), Arctostaphylos sp.

824
●137 *Juniper berries (wa·'at), Juniperus californica Carr, var. utahensis and J. utaliensis Lemmon; Great Basin floral area; berries of both species mature second yr.

Elderberries (ku·hupĭl), Sambucus velutina D & H; foothill floral area; eaten (SM), not eaten (FP).

Wild grapes (wo·lo·nt), probably from Vitis californica Benth.; gathered in Koso territory near Inyo-Kern.

Deadly nightshade berries (mane·ẓa'), Solanum nigrum L., foothill floral area.

Roots (generic term wi·šin) included: Tule roots (si'i·bĭ·l), Scirpus acutus Muhl; marshes in general.

*Cattail roots (to·ibĭ·l), Typha latifolia L.; general in ponds.

Bulbs (generic term ko·mbin) included: Mariposa lily bulbs (ho·ẓišt), Calochortus venustus Dougl., and C. palmeri Wats.; foothill floral area.

Bulbs (yambal) which were 1 1/2 in. long, "looked like potatoes"; plentiful at Fay ranch in mts. N of Weldon and at Tejon (SM).

Stalks (generic term u·'un) included: *Spanish bayonet (kuyat), Yucca whipplei Torr.; foothill and desert floral areas. Cf. kuya'dibĭ·l, center stalk of Y. whipplei, used in manufacture of bull-roarer.

*Red thistle (čiyiyal), Cirsium occidentale (Nutt.) var. coulteri Jepson; foothill floral area.

Mescal (kukt), Nolina parryi Wats.; desert floral area.

Wild rhubarb (aba·nal), species of dock.

Leaves (generic term nanhabĭ·l), pods, receptacles (ča'a·bil) included: *Leaves, stalks, heads of wild onion (ši·wil), Allium peninsulare Lemmon, A. hyalinum Curran, and wild garlic (wowo·l, testicles), A. lacunosum Wats.; foothill floral area.

*Leaves of Coreopsis bigelovii (Gray) Hall (ibi·l, also generic term for flower); desert and dry interior floral areas.

*Leaves, stems of small red variety of clover (panwal); of larger variety (panwal u·wan), Trifolium involucratum Ort., foothill floral area; and of variety which was tall, "sour" and grew in moist places (panwal tuwuganan).

*Leaves (tu·t), stems of salt grass (tu·bu·l), Distichlis spicata (L.) Greene; saline soil.

Leaves of Cotyledon laxa (Lindl.) Brew. & Wats. (ma·šali·nu, Spanish loan word); foothill floral area.

Leaves of fiddle necks (ugabul), Lotus scoparius (Nutt.) Ottley, and Ellisia membranacea Benth. (ka·mu·yah), foothill and desert floral areas, respectively.

Leaves, stalks of Monardella candicans Benth. var. exilis Gray (ka·lukt, the armpit); desert floral area; of Pellaea compacta Max (tča), foothill floral area; of mountain tea (u'tu·dul), Ephedra viridis Coville.

[p.15 (b)]

824
●137
[117
252]

Leaves, stems watercress (beros, Spanish loan word), Radicula nasturtium-aquaticum (L.) Britt. & Rendle, not eaten aboriginally; sometimes boiled now for greens; leaves of wild mustard (hi·ulit), Sisymbrium officinale L., fried in grease; "learned this from Mexicans" (SM).

Immature pods of tree yucca or Joshua tree (umu·bï·l), Yucca brevifolia Engelm.; desert floral area.

Receptacle of cacti (ïya·l), Opuntia caseyi Britt. & Rose var. magenta Pursh and O. basilans Engelm.; desert floral area.

Some plant species named, but put to no use, as: wild lilac (to·bu·l), Ceanothus divaricatus Nutt., foothill floral area; choya cactus (u·šil), desert floral area; California poppy (yogobul), Eschscholtzia californica Cham. and E. minutiflora Wats. (same name), foothill, desert floral areas, respectively; several varieties of lupines (šïmïndïŋ taman, rattlesnake's teeth, so named because pistils and stamens protrude from keel of flower like teeth, SM), Lupinus sparsiflorus Benth., L. odoratus Heller, desert floral area, L. albifrons Benth., L. densiflorus Benth. var. lacteus C.P.S., foothill floral area, L. microcarpus Sims, var. ruber C.P.S., L. micranthus Dougl. Few other plants also named, rejected as food (p. 12).

For 86 plant species SM could give no economic, medicinal uses or names, referring to all of them as weeds (mašil): Albronia pogonantha Heimerl.; Achillea millefolium L. var. lanulosa Piper; Agoseris alpestris Greene; Azolla filiculoides Lam.; Baeria chrysostoma F. & M.; Brickellia californica T. & G.; Bromus rubens L.; Castilleia miniata Dougl.; Centaurium venustum Rob.; Centromadia (Henizonia) pungens (T. & G. Greene); Cerastium arvense L.; Chaenactis stevioides H. & G.; Cheilanthes covillei Max.; Chenopodium californicum Wats.; Chorisanthe staticoides Benth., C. watsonii T. & G., C. thurberi (Gray) Wats.; Chrysothamnus teretifolius Hall; Cotula coronopifolia L.; Cryptantha miriculata (A. DC.) Greene; Cuscuta californica Choisy; Datisca glomerata Brew. & Wats.; Delphinium hansenii Greene, D. purpusii Brandegee; Dicentra chrysantha (H. & A.) Walp.; Emmenanthe penduliflora Benth.; Encelia actoni Elmer; Epilobium californicum Hausskn.; Epipactis gigantea Dougl.; Ericameria cuneata (Gray) McCl. var. spathulata Hall; Erigeron divergens T. & G.; turkey mullein, Eremocarpus setigerns Benth.; Eriogonum argillosum J. T. Howell, E. angulosum Benth., E. mohavense Wats.; Eriophyllum ambiguum Gray, E. pringlei Gray, E. confertiflorum Gray; Euphorbia serpyllifolia Pers.; Galium angustifolium Nuss.; Gilia latiflora Gray, G. capitata Dougl.; Godetia viminea Spach; Greeneocharis circumscissa (Torr.) Rydb.; Gymnogramma trianularis Kaulf.; Hugelia filifolia Jepson; Langloisia matthewsii (Gray) Greene; Lepidospartum squamatum Gray; Linanthus aurens (Nutt.) Greene; Lotus strigosus (Nutt.) Greene, L. oblongifolius (Benth.) Greene, L. argophyllus

824 (Gray) Greene; Lycum cooperi Gray; Marrubium
137 vulgare L.; Malacothrix californica DC.; Melilotus indica All.; Mimulus gluttatus D.C., M. cardinalis Dougl.; Mirabilis laevis (Benth.) Curran; Montia perfoliata (Donn) Howell; Nama demissum Gray; Oenothera alyssoides and O. alyssoides T. & G. var. decorticans Jepson, O. bistorta Nutt., O. caespitosa Nutt., O. contorta Dougl., O. pallida Lindl., O. palmeri Watson, O. scapoidea T. & G.; Pallaea and romedaefolia Fee; Penstemon laetus Gray, P. palmeri Gray, P. breviflorus Lindl.; Phacelia tanecilifolia Benth., P. hispica Gray var. cicutaria McB.; Platystemon californicum Benth.; Polygonum persicaria L.; Ranunculus aquatilis L.R. var. cymbalaria Pursh.; Rumex crispus L., R. hymenosepalus Torrey; Senecio douglasii DC.; Sidalcea malvaeflora Gray; Sisymbrium incisum Engelm.; Sphaeralcea (Malvastrum) exile (Gray) Jepson; Stenotopsis linearifolius (DC.) Rydb.; Stephanomeria exigua Nutt. var. pentachaeta Hall, S. virgata Benth.; Tropidocarpum gracile Hook.; Vaccaria vulgaris Host.

This list probably represents only small fraction of indigenous plants available to Tübatulabal, of which they made no use; it serves to illustrate, in concrete fashion, selective processes at work, among people of hunting-gathering culture, in their utilization of their floral environment, and negative rôle which part of that environment played in their culture.

Plants put to other ethnobotanical uses, for curing, house building, etc., referred to in discussions of these subjects.

222 Gathering of plant food.- When acorns ripe,
[462] "all the people except very old persons and young children went together to get them" (SM); women chiefly collected them while men hunted, trapped.
251 Acorns gathered from ground in small conical baskets, transferred when baskets full to large basket, in which they were brought back to camp and spread out on deerskins, tule mats for 3-4 days to dry, this preventing acorns from sweating when cached; then stored at acorn grounds, in elevated caches. Acorns gathered near home packed back to hamlets, cached near houses.

222 When berries ripe on shrub (opo·bol), Rhamnus
824 californica cuspidata (Greene) Wolf, which grows in foothill floral area, "the people knew piñons were ready to be gathered in the mts. So some men went out first to see where the piñons were good; just any men went; they decided, and then everybody went to the places where these men said the nuts were plentiful" (SM). All inhabitants of
[887] hamlet or of several hamlets went together; sometimes very old persons might not stay at piñon camp when weather became too cold, but return to hamlet alone. Piñons gathered when cones reached maturity, but before they had opened; men, boys knocked cones off trees with staves or pulled down branches with "shepherd's crook" staff; men, women picked up cones, put them in conical lug baskets which were emptied into larger conical

171 use honey dew which forms on Phragmites communis, also on rush, Juncus; Yavapai and Papago obtain it principally from willow, but also from cane.

262 Tübatulabal also occasionally sucked sections of freshly cut cane for its sweetness (SM).

263 Saline crystals which form in dry hot weather on salt grass made into "salt" (tu·t). Salt grass 258 grows in saline areas, on valley floors, at base ●137 of foothills; its utilization among Tübatulabal 824 depended on weather, as "after a rain it takes a month for salt grass to get salt again" (SM). Grass cut, spread out on mats to dry in sun; after grass thoroughly dry same process followed as described above for obtaining honey dew, save that collected crystals made up into balls or flat cakes instead of being spread on tule tray. Chunks [272 equal to 2-3 full tablespoons broken off dry ball, 278 dissolved in cupful of water and drunk either for 751] refreshment or as laxative and to rinse out stomach. Salt-grass crystals also obtained by children who took willow switches and "swept" salt grass with them early on summer mornings; when sufficient quantity of crystals had adhered to stick, child took it to shady spot and licked off crystals. Fresh salt grass soaked in water and this [262 water sprinkled over raw chopped clover, or sprigs 263] of salt grass and clover rolled between hands and eaten. Substance manufactured from salt grass never used to season meat or mushes.

314 Chewing gum made from milky juice of Asclepias 824 erosa Torr. (pololi·wa·bĭ·l); stalk of plant cut near top before it blossomed and juice collected in 4-in. tubular sections of jointed stalk of Eriogonum elongatum gramineum n. var. Stokes (ined.), (šiko·ništ). Joint of stalk served as natural stopper for bottom end of tubular section; juice run into stalk through open upper end; filled sections of stalk set in hot ashes to roast until plant juice inside has congealed; stalks then cut open, gum removed and chewed. This gum "better than store gum" (ES).

262 Meals.- Meals eaten twice daily around sunrise 264 and before sundown. At morning meal (wi·lil) and evening meal (tu·kil) men, children ate first, then women. Meat eaten at both meals, "if people [415] had it." Men, women used spoons (ta·mil) made from antelope horn (ša·wun) for eating acorn mush (SM), or wooden spoons (FP); PN said spoons of elk, antelope horn not made. Acorn mush eaten with fingers (MM). No formula spoken before eating. Children pieced during day; "mothers gave [753 them a cup of chia gruel" (SM). Food rarely eaten after dark as ghosts "come around at night; they [774 might throw something in the food that would make a person sick" (SM, FP). Because strangers poten- [609] tial enemies who might put poison in food, person avoided eating with them. Women when out for day gathering seeds, tending tobacco, etc., took lunch with them which they ate about 10 or 11 a.m.; men hunting deer "didn't take any food; they came home in the evening" (FP).

524 534 Bull-roarer.- Bull-roarer (ku·lišt, lit., instrument for playing, i.e., toy) made from stalk of Spanish bayonet, Yucca whipplei Torr., foothill, desert floral areas. Stalk dried, split in half, section 8-10 in. cut off, attached at center (sic) to 4-ft. length of native twine; stick handle lacking. Boys' toy (SM).

TOBACCO

137 249 Two species of tobacco (šo'ogonht), Nicotiana bigelovii Wats. and N. attenuata Torr., grow wild on floors of Kern and South Fork valleys and on slopes of lower foothills, at elevation from 2500-2800 ft. Of 2 species, N. bigelovii commoner than smaller-leaved N. attenuata, but native term is same for both and 2 species grow side by side, sometimes less than 1 ft. apart. At various points in South Fork valley not yet under cultivation wild tobacco plants are concentrated in 1- or 2-acre patches or fields (šo'ogonhtiŋ ugan), sparsely interspersed with low clumps of brush and turkey mullein; from such fields (pl. 3) tobacco was and still is (1933) being gathered for use by Tübutulabal women.

249 Tending and preparation.- Tobacco patches never burned over in fall; although ES drew my attention to half-burned clump of brush situated in patch she and FP were "working" in 1932, saying tobacco seemed to grow better where ground had been burned over, she and SM both said tobacco patches were never fired in order to produce better stands of plants next year. "The rain is what makes the plants grow" (SM).

In spring, about June 1, when plants 18-24 in. high, and beginning to blossom, women working singly or in groups of 2-3 began tending wild tobacco. This first tending consisted in snipping off, with thumb and index finger of right hand, side shoots and occasionally tips of plants. Hardy plants, mainly of bigelovii species, which did not have too many small shoots clustering around base of main stalk, selected for attention; after woman had pruned plant she would sometimes, but not always, wrench off some of large leaves which grow flat on ground around base of plant, and occasionally she would uproot weed growing close by plant. Selection of plants to tend made more or less at random from among numerous healthy specimens surrounding women workers; according to MM it was owing to this that later, several pruned plants were overlooked at final harvesting of crop. At first pruning of their 1932 crop ES and FP worked from 6 a.m. to around 10 a.m.; all trips to tobacco patch made early in morning, to take advantage of comparative coolness for, although pruning itself not difficult, it necessitates almost constant stooping over plants in full glare of hot midsummer sun. Also sun makes tobacco "strong" and sticky

276
756
789 Plate 1. a, Steban Miranda with steatite bowls and pipes used in rain making. b, Frances Philips. c, Estefana Miranda Salazar. d, Mike Miranda.

133
137
342 Plate 2. a, central section of South Fork valley, looking S to Nichols peak and Paiute mts. from Steban Miranda's rancheria, village site no. 9. In foreground sagebrush, Digger pines, scrub oak; in valley beyond, willows and cottonwoods. b, village site no. 9, Steban Miranda's rancheria, looking E. In foreground cottonwoods around springs; on mts. in background Digger pines. c, e. end of South Fork valley, 6 mi. above Onyx, looking NE. In foreground sagebrush, in middle background tree yuccas, on mt. slopes Digger pines.

249 Plate 3. a, field of wild tobacco, 1/2 mi. E of Weldon, central South Fork valley. b, tobacco plants in field shown above, after third pruning, showing enlarged leaves. Dimensions of envelope at base of plants 3 1/2 x 6 1/2 in. c, samples of tobacco plants taken from patch shown above after final gathering of crop. From left to right, 1, 2, 3, plucked stalks, 1, 16 in. high, 2, 3, 24 in. high; 4, 5, unplucked plants overlooked in final gathering, height 38 in., leaves 6-8 in. long, 2 1/2-3 in. wide; 6, large untended

[p. 84(a)]

133

133
137
342

133